

Application No.: 09/504,782
Attorney Docket No.: 740819-337
Art Unit 2828

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REMARKS

The Office Action of July 31, 2003 was received and carefully reviewed. The Applicants have amended claim 1 and 4 and support for those amendments appear at least at page 18, lines 11-17 of the specification. Reconsideration and withdrawal of the currently pending rejection is requested for the reasons advanced in detail below. Claims 1-30 are currently pending, with claims 7-30 being withdrawn from consideration as being directed to non-elected inventions.

With regard to the Examiner's rejection of claims 1-6, under 35 U.S.C. 102(b), as being anticipated by the teachings of Sverdlov '337, this rejection is respectfully traversed.

The presently claimed invention, i.e., independent claim 1 as amended, recites the following essential features:

a first cladding layer, which is made of a nitride semiconductor of a first conductivity type and is formed over a substrate;

an active layer, which is made of $\text{In}_x\text{Ga}_{1-y}\text{N}$ and is formed over the first cladding layer; and

a second cladding layer, which is made of still another nitride semiconductor of a second conductivity type and is formed over the active layer,

wherein an $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer of the first conductivity type is formed between the substrate and the first cladding layer, and wherein $0 < x < 1$, $0 < y < 1$ and $x \geq y$ in the composition of In . (emphasis added)

and for the claim 4 the essential features are:

a first cladding layer, which is made of a nitride semiconductor of a first conductivity type and is formed over a substrate;

an active layer, which is made of $\text{In}_x\text{Ga}_{1-y}\text{N}$ and is formed over the first cladding layer;

a second cladding layer, which is made of still another nitride semiconductor of a second conductivity type and is formed over the active layer; and

an electrode formed over the second cladding layer,

wherein an $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer of the second conductivity type is formed between the second cladding layer and the electrode, and wherein $0 < x < 1$, $0 < y < 1$ and $x \geq y$ in the composition of In . (emphasis added)

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As discussed previously, by providing the claimed sequence of a substrate, an $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, a first cladding layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ layer, and a second cladding layer for claim 1, the effect of spontaneous emission from the active layer being absorbed by the $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer can be achieved which avoids the problem of the mixing of spontaneous emissions with the laser radiation, as discussed in the specification, page 4, line 15, to page 5, line 22. The claimed sequence of claim 4 of a substrate, a first cladding layer, an $\text{In}_y\text{Ga}_{1-y}\text{N}$ layer, a second cladding layer, an $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer, and an electrode provides similar benefits.

However, according to Sverdlov '337 (column 4, lines 12-65; Figure 1) the Group III-V light emitting device does not teach or suggest the sequence of layers described above. That is, Sverdlov '337 teaches providing on either side of the active layer 20 of $\text{In}_y\text{Ga}_{1-y}\text{N}$ sandwich core layers 18 and 22 of $\text{In}_x\text{Ga}_{1-x}\text{N}$ which in turn have cladding layers of 16 and 24 placed thereover, as illustrated below:

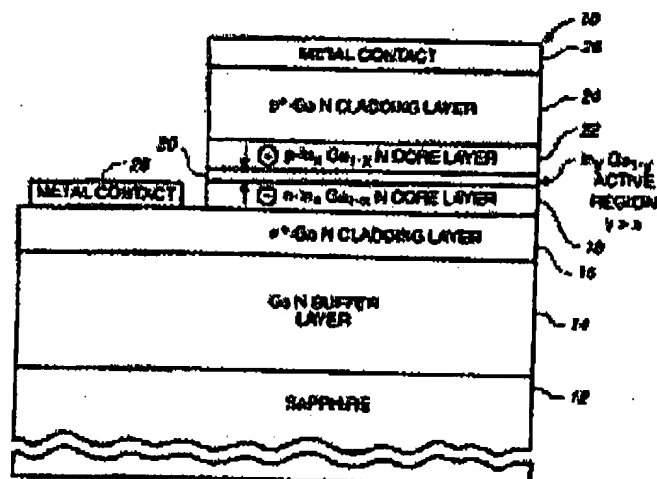


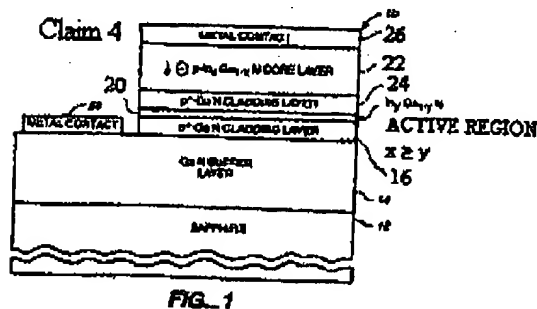
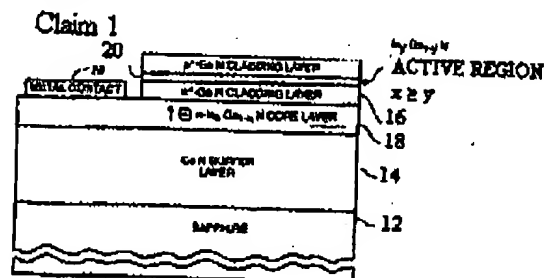
FIG. 1

What is significant about this teaching is that the sandwich core layer 18 is not provided between the substrate 12 and the first cladding layer 16 as set forth in claim 1; nor is the sandwich core layer 22 provided between the electrode 26 and the second cladding layer 24 as set forth in claim 4. Additionally, the relationship of Sverdlov '337 that " $y > x$ " is

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exactly the opposite of the claimed relationship of the " $x \geq y$ " of both claims 1 and 4. Using the teaching of Sverdlov '337 to illustrate the claims 1 and 4 inventions:



it can be clearly seen that in claim 1, illustrated above, the core $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer 18 is adjacent the buffer layer 14 and between the substrate 12 and the first cladding layer 16. That is, the sequence of layers 16 and 18 is reversed from that of the Sverdlov '337 teaching. Additionally, the relationship of " y " to " x " is also reversed for claim 1 such that " $x \geq y$ " rather than " $y > x$ " of Sverdlov '337. In a similar manner, claim 4, illustrated above, indicates that the $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer 22 is adjacent the second cladding layer 24 and between the electrode 26 and the second cladding layer 24. Again, the sequence of layers 22 and 24 is reversed from the teachings of Sverdlov '337.

Hence, the present invention is different from that of Sverdlov '337, in that besides the active layer, the claimed $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer is also interposed between the substrate and the first cladding layer or between the second cladding layer and the electrode. If the Examiner is to maintain the assertion that Sverdlov '337 does teach or suggest placing the claimed $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer between the substrate and the first cladding layer (or that claimed $\text{In}_x\text{Ga}_{1-x}\text{N}$ layer is between the second cladding layer and the electrode), then it is specifically requested that the Examiner provide a detailed indication of where in the disclosure of the '337 patent such an illustration or explanation is provided. Further, it is

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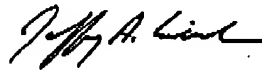
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requested that the Examiner point to that portion of the '337 patent in which the claimed relationship of " $x \geq y$ " is taught or suggested.

Without such a detailed showing and since the Sverdlov '337 does not teach each and every feature of the instant claims 1-6 as discussed above, the instant claims 1-6 are not anticipated by the teachings of Sverdlov '337. Consequently, it is respectfully requested that the rejection, under §102, be withdrawn.

Having responded to all rejections set forth in the outstanding Office Action, it is submitted that claims 1-6 are in condition for allowance. An early and favorable Notice of Allowance is respectfully solicited. In the event that the Examiner is of the opinion that a brief telephone or personal interview will facilitate allowance of one or more of the above claims, the Examiner is courteously requested to contact Applicants' undersigned representative.

Respectfully submitted,



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